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public intellectual property resource for agriculture

PIPRA UPDATE

Intellectual Property Management within the PD Consortium

Alan Bennett
Executive Director, PIPRA
Associate Vice Chancellor Research, UC Davis

December 13, 2007

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R&D Pipeline

Duration*:	
24 to 48 mo	**DISCOVERY**: gene/trait identification
12 to 24 mo	**PHASE I**: proof of concept
12 to 24 mo	**PHASE II**: early product development
12 to 24 mo	**PHASE III**: advanced development – begin regulatory submission
12 to 36 mo	**PHASE IV**: final Regulatory submission

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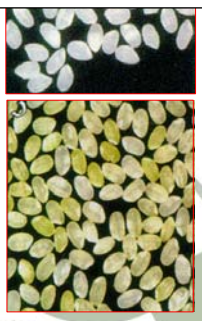
… IP challenges can mean missed opportunities for public research

70 proprietary technologies (40 US patents)

- ***IP uncertainty***
- ***High transaction costs***



"Golden" rice

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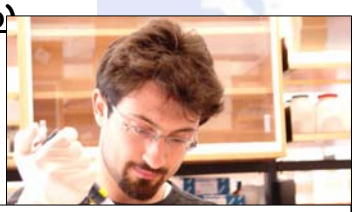
The Public Intellectual Property Resource for Agriculture

A tool to promote innovation and overcome IP "blocks

46 Institutional Members in 13 Countries

Law firms and legal services (pro bono)

- Townsend and Towsend and Crew
- DLA Piper Rudnick Gray Cary
- Morrison and Foerster
- Harness, Dickey and Pierce
- Foley Hoag
- Edwards & Angell



THE ROCKEFELLER FOUNDATION

ENERGY

PD/GWSS BOARD

the UC Discovery Grant

SPF
THE SASAKAWA PEACE FOUNDATION

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Overview

1. PD Literature and Intellectual Property Database
2. Impact Database – annual reporting updates
3. Intellectual Property/Technical Audits

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Information and analysis
for researchers

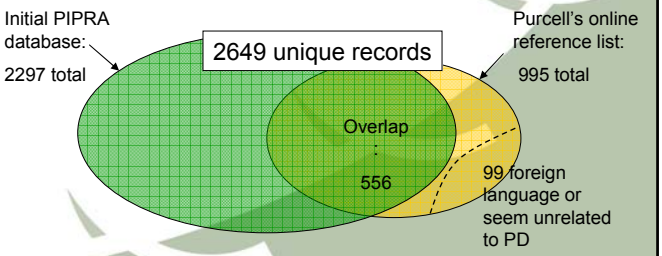
PD/GWSS Database: What it Contains

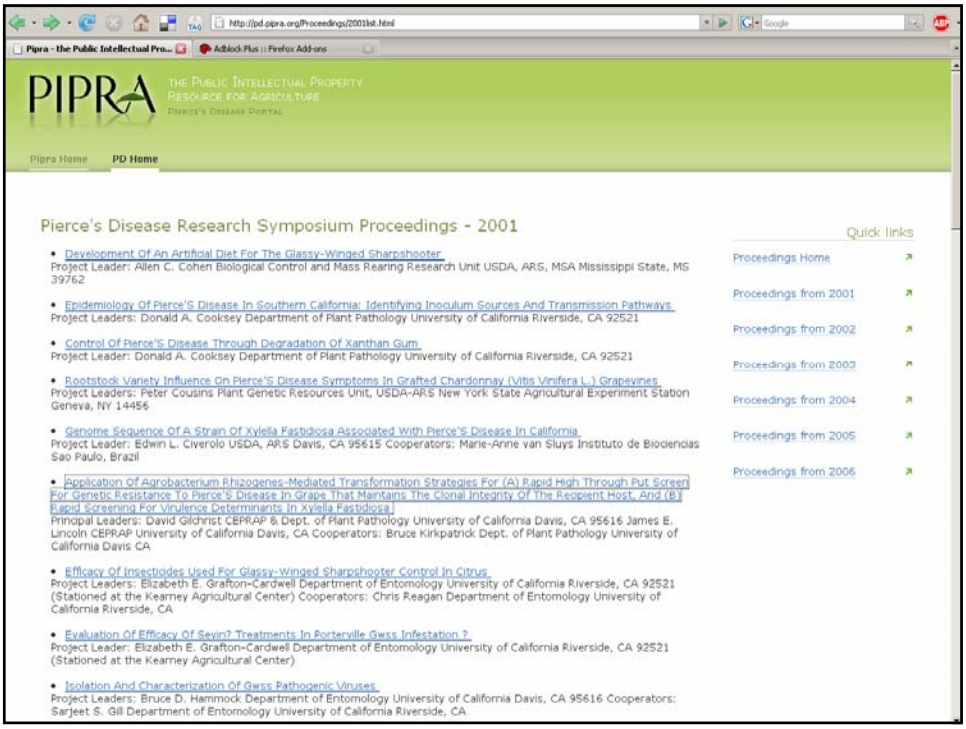
Intellectual Property:

- **6,335 US Patents & Patent Applications**
- **30 US Patents & Patent Applications directly related to PD**

Literature: 2,649 records

- **Scientific Literature**
- **Symposia Proceedings**
- **Research abstracts and summaries**





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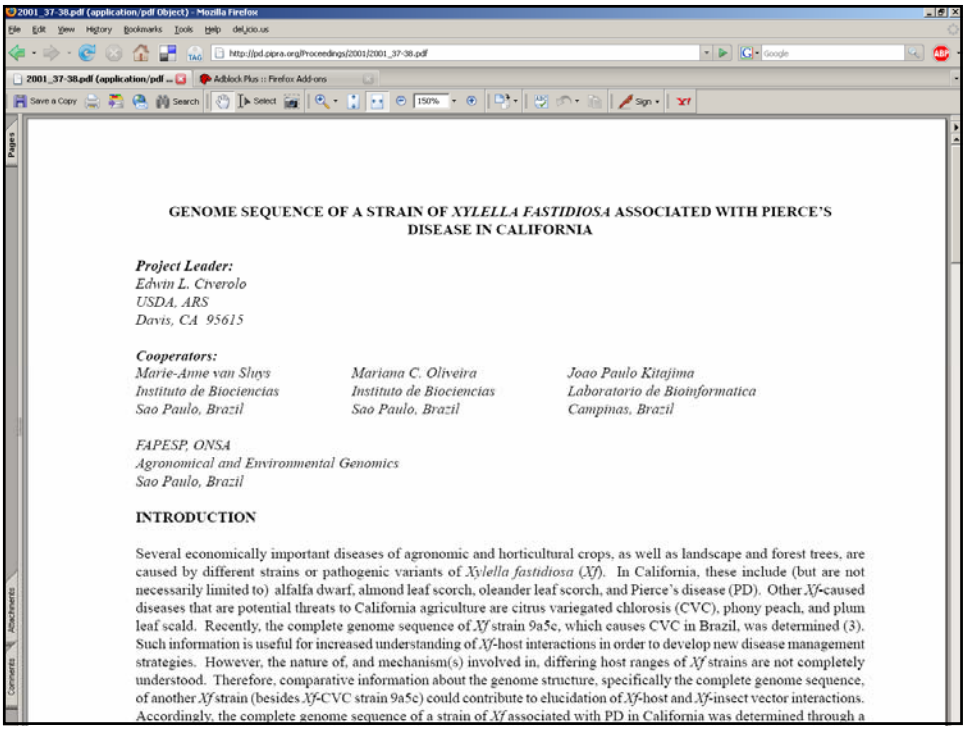
PIERCE'S DISEASE PORTAL

Pipra Home | PD Home

Pierce's Disease Research Symposium Proceedings - 2001

- Development Of An Artificial Diet For The Glassy-Winged Sharpshooter
  Project Leader: Allen C. Cohen Biological Control and Mass Rearing Research Unit USDA, ARS, MSA Mississippi State, MS 39762
- Epidemiology Of Pierce'S Disease In Southern California: Identifying Inoculum Sources And Transmission Pathways
  Project Leaders: Donald A. Cooksey Department of Plant Pathology University of California Riverside, CA 92521
- Control Of Pierce'S Disease Through Degradation Of Xanthan Gum
  Project Leader: Donald A. Cooksey Department of Plant Pathology University of California Riverside, CA 92521
- Rootstock Variety Influence On Pierce'S Disease Symptoms In Grafted Chardonnay (Vitis Vinifera L.) Grapevines
  Project Leaders: Peter Cousins Plant Genetic Resources Unit, USDA-ARS New York State Agricultural Experiment Station Geneva, NY 14456
- Genome Sequence Of A Strain Of Xylella Fastidiosa Associated With Pierce'S Disease In California
  Project Leader: Edwin L. Civerolo USDA, ARS Davis, CA 95615 Cooperators: Marie-Anne van Sluys Instituto de Biociencias Sao Paulo, Brazil
- Application Of Agrobacterium Rhizogenes-Mediated Transformation Strategies For (A) Rapid High Through Put Screen For Genetic Resistance To Pierce'S Disease In Grape That Maintains The Clonal Integrity Of The Recipient Host, And (B) Rapid Screening For Virulence Determinants In Xylella Fastidiosa
  Principal Leaders: David Gilchrist CEPRAP & Dept. of Plant Pathology University of California Davis, CA 95616 James E. Lincoln CEPRAP University of California Davis, CA Cooperators: Bruce Kirkpatrick Dept. of Plant Pathology University of California Davis CA
- Efficacy Of Insecticides Used For Glassy-Winged Sharpshooter Control In Citrus
  Project Leaders: Elizabeth E. Grafton-Cardwell Department of Entomology University of California Riverside, CA 92521 (Stationed at the Kearney Agricultural Center) Cooperators: Chris Reagan Department of Entomology University of California Riverside, CA
- Evaluation Of Efficacy Of Sevin? Treatments In Porterville Gwss Infestation ?
  Project Leader: Elizabeth E. Grafton-Cardwell Department of Entomology University of California Riverside, CA 92521 (Stationed at the Kearney Agricultural Center)
- Isolation And Characterization Of Gwss Pathogenic Viruses
  Project Leaders: Bruce D. Hammock Department of Entomology University of California Davis, CA 95616 Cooperators: Sarjeet S. Gill Department of Entomology University of California Riverside, CA

Quick links
- Proceedings Home
- Proceedings from 2001
- Proceedings from 2002
- Proceedings from 2003
- Proceedings from 2004
- Proceedings from 2005
- Proceedings from 2006



GENOME SEQUENCE OF A STRAIN OF *XYLELLA FASTIDIOSA* ASSOCIATED WITH PIERCE'S DISEASE IN CALIFORNIA

Project Leader:
Edwin L. Civerolo
USDA, ARS
Davis, CA 95615

Cooperators:
Marie-Anne van Sluys
Instituto de Biociencias
Sao Paulo, Brazil

Mariana C. Oliveira
Instituto de Biociencias
Sao Paulo, Brazil

Joao Paulo Kitajima
Laboratorio de Bioinformatica
Campinas, Brazil

FAPESP, ONSA
Agronomical and Environmental Genomics
Sao Paulo, Brazil

INTRODUCTION

Several economically important diseases of agronomic and horticultural crops, as well as landscape and forest trees, are caused by different strains or pathogenic variants of *Xylella fastidiosa* (*Xf*). In California, these include (but are not necessarily limited to) alfalfa dwarf, almond leaf scorch, oleander leaf scorch, and Pierce's disease (PD). Other *Xf*-caused diseases that are potential threats to California agriculture are citrus variegated chlorosis (CVC), phony peach, and plum leaf scald. Recently, the complete genome sequence of *Xf* strain 9a5c, which causes CVC in Brazil, was determined (3). Such information is useful for increased understanding of *Xf*-host interactions in order to develop new disease management strategies. However, the nature of, and mechanism(s) involved in, differing host ranges of *Xf* strains are not completely understood. Therefore, comparative information about the genome structure, specifically the complete genome sequence, of another *Xf* strain (besides *Xf*-CVC strain 9a5c) could contribute to elucidation of *Xf*-host and *Xf*-insect vector interactions. Accordingly, the complete genome sequence of a strain of *Xf* associated with PD in California was determined through a

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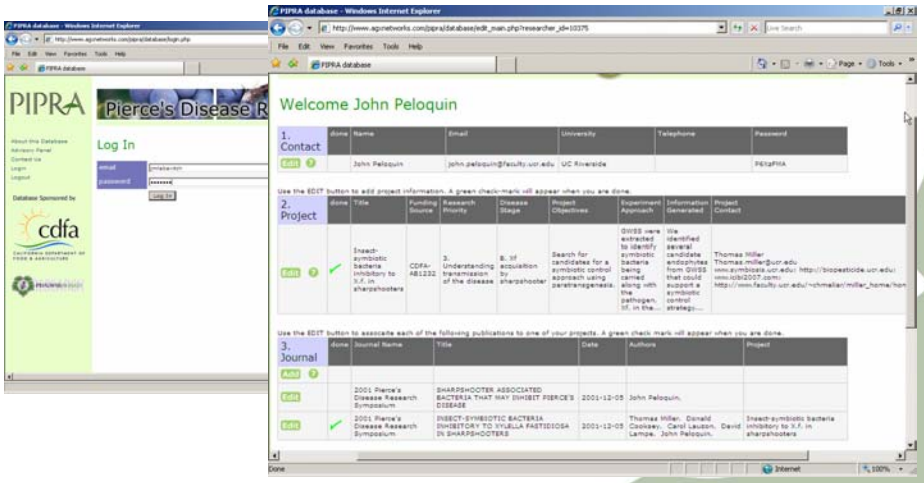
Information and analysis
for researchers and reviewers



Impact Reporting Database

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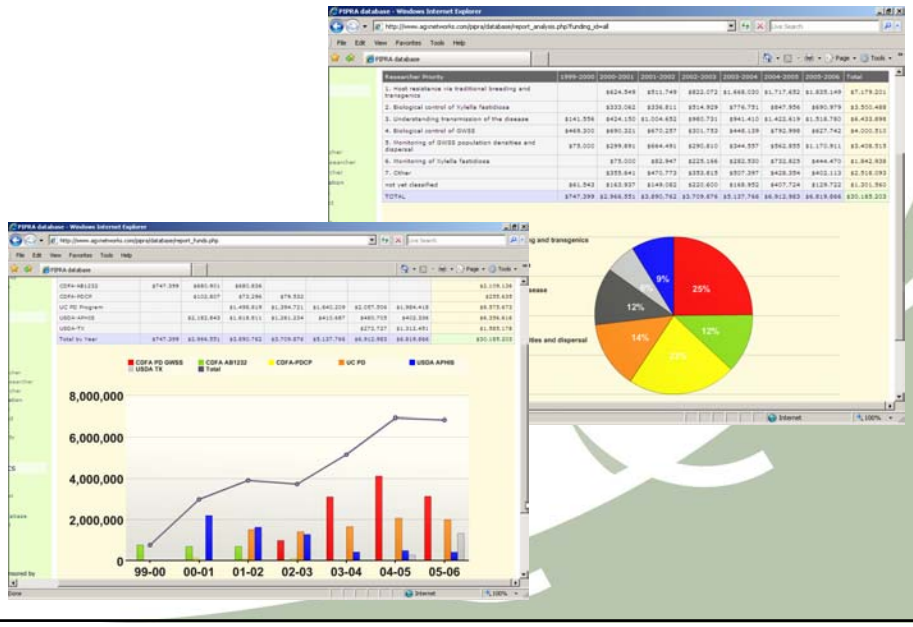
Information and analysis
for researchers and reviewers



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Impact Reporting Database

Updating the project information

- Centralized and easier means for researcher updates and reports.
- First option is an online form. This can be found at: http://pd.pipra.org/database/cdfa-demo.html currently.
- Second option is a Microsoft Word form.

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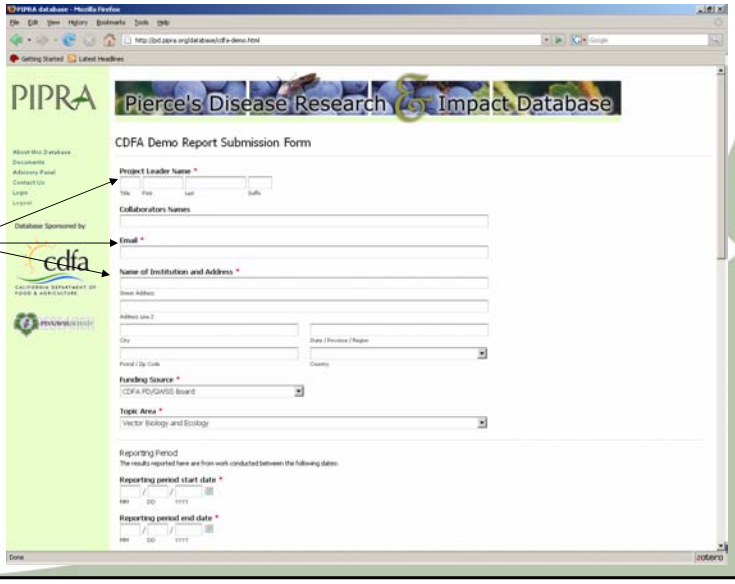
Impact Reporting Database

First option: Online form

Various fields included in the form

Fields marked with red star (*) required



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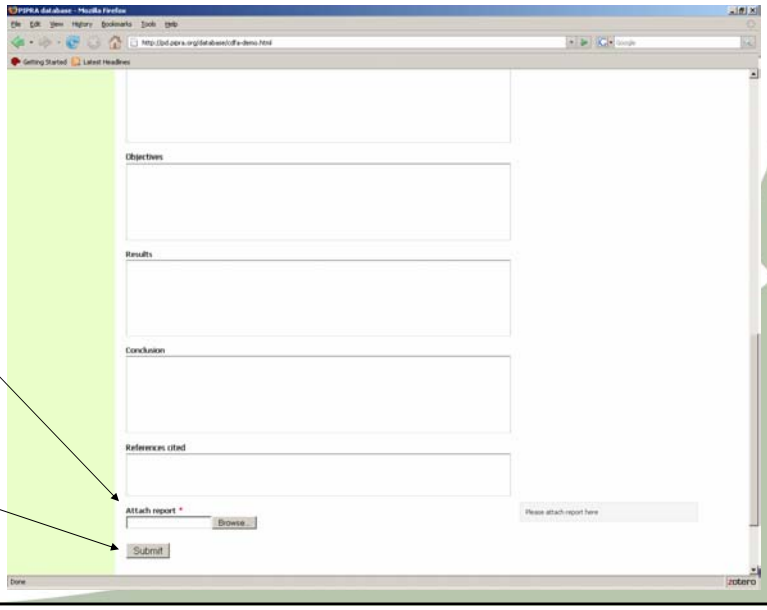
Impact Reporting Database

Fill in fields with text, and attach PDF version of report

Click 'Submit' when report is completed



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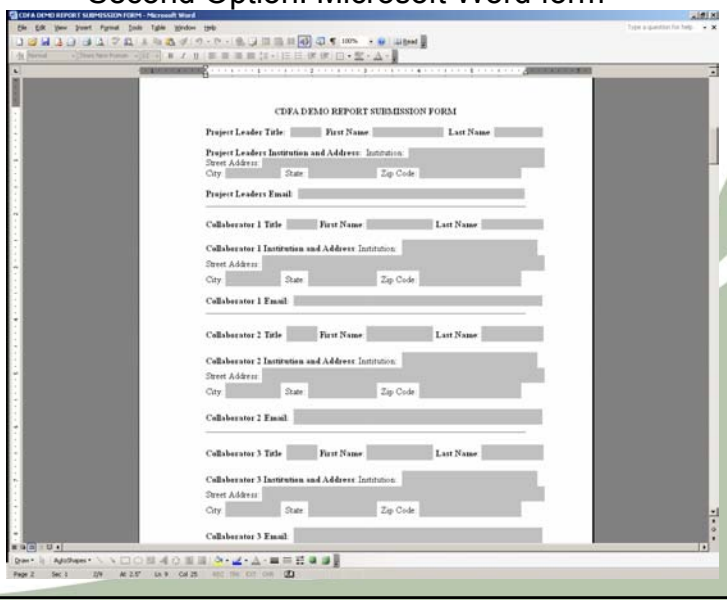
Impact Reporting Database

Second Option: Microsoft Word form

Contains the same fields as the online form

This option prevents loss of formatting, and allows data to be extracted automatically by software created by PIPRA.

This form can be submitted by attaching to an email



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R&D Pipeline

Duration*:	
24 to 48 mo	**DISCOVERY**: gene/trait identification
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PD Project Portfolio

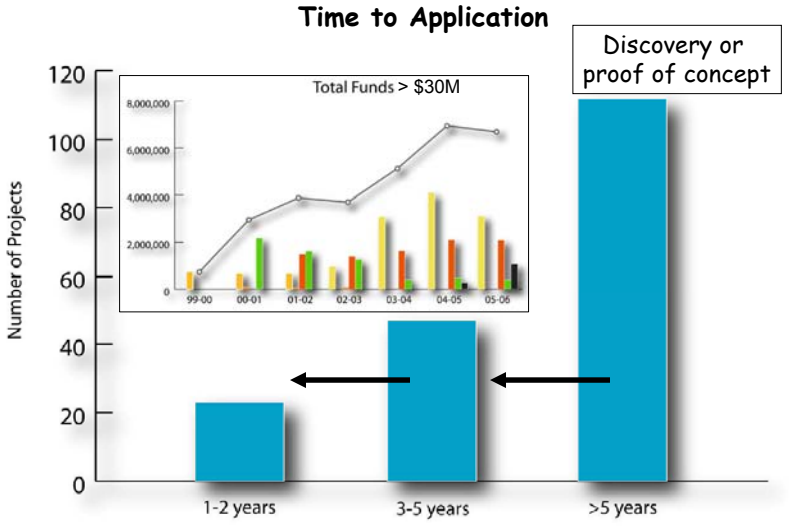

Figure 5. Timelines of funded research projects.

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R&D Pipeline

Duration*:	
24 to 48 mo	**DISCOVERY:** gene/trait identification
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6 – 13 years	

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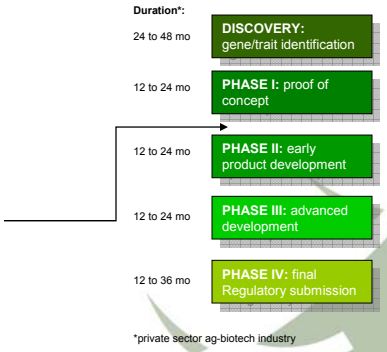
IP/Technical Audits

Intellectual and Technical Audit of a Selected Research Project

- Research is passing phase I – proof of concept
- End-product is feasible for application
- Technology can be marketed through different end-products (e.g. rootstock transgenics or as a surfactant)
  - Provides greater flexibility in case of IP blocks



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IP and Technical Audit

Intellectual and Technical Audit of a Selected Research Project

Identifies all IP embedded in one particular technology.

- IP protecting components, methods and application of the technology

- Evaluates contractual agreements entered by researchers, research institutions and all participating parties
  - Material transfer agreements
  - Employment contracts
  - Licensing contracts

- Suggests strategy options for the development and deployment of the target technology
  - Identify potential legal obstacles
  - IP suggestions
  - Marketing opportunities

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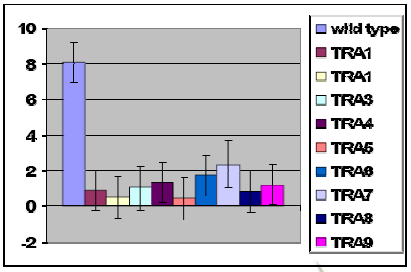
IP and Technical Audit of Diffusible Factor Signal

Intellectual and Technical Audit of a Selected Research Project

…Selected technology *"Management of Pierce's Disease of Grape by Interfering with Cell-Cell Communication of Xf"* lead by Steven Lindow (UC Berkeley)

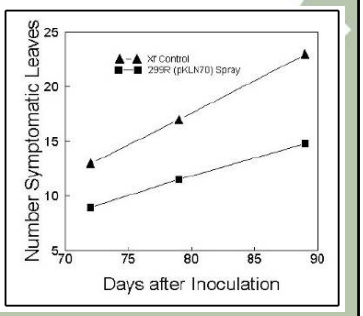
I. DSF in Transgenic Grape Rootstocks

GE grape plant that over-expresses DSF exhibit a reduction in disease transmission and onset of symptoms



II. Topical Application of GE bacteria expressing DSF

Spray grape plants with GM endophytes designed to over-express or degrade DSF (tested- *E. coli*, *E. herbicola*)



III. Aerosol Topical Application of Purified DSF

Source: Lindow, S; Chatterjee, S.; Purcell, A. Pierce's Disease Research Symposium Proceedings 2006, pg. 181-2

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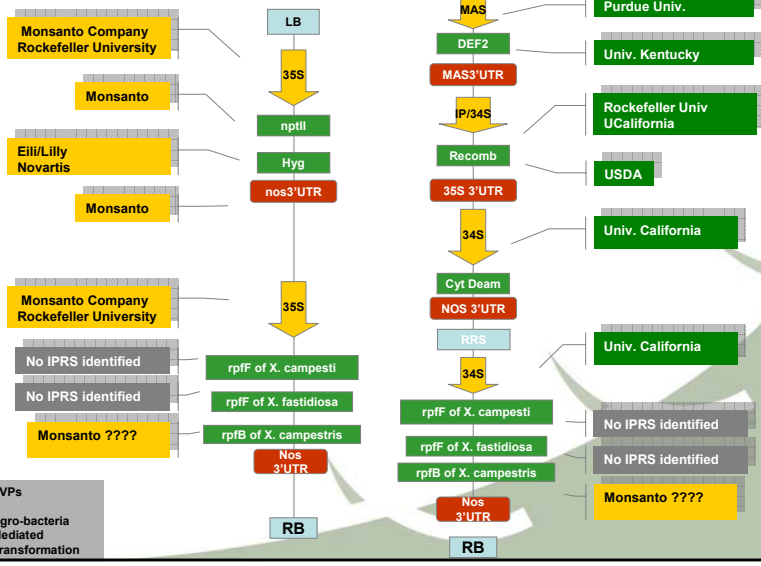
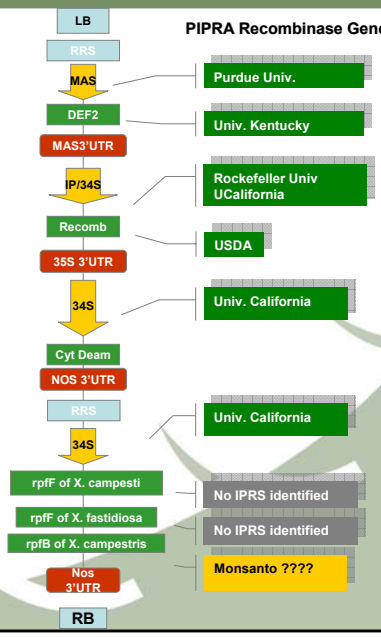
Technical audits of Expression Construct for path to commercialization

DSF in Transgenic Grape Rootstocks



PIPRA Recombinase Gene-Excision Vector



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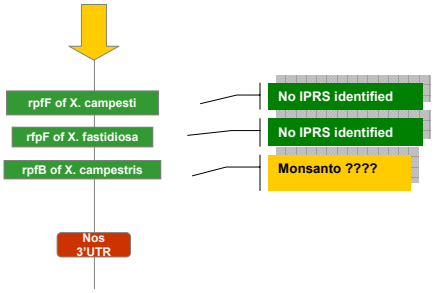
Technical audits of Expression Construct for path to commercialization

II. **Topical Application of GE bacterial expressing DSF-interfering**

III. **Aerosol Topical Application of Purified DSF—if DSF is expressed in bacteria**



IP specific to Bacterial Expression System

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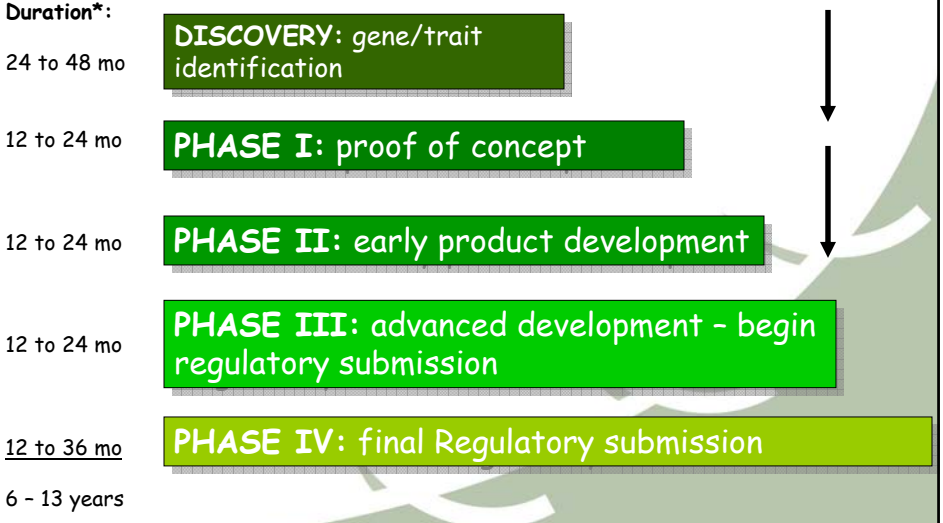
R&D Pipeline

Should projects address downstream hurdles and propose solutions?



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Contact at PIPRA

- abbennett@ucdavis.edu
- rvpatel@pipra.edu